

What is Claimed is:

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1. A method for prioritizing access to a shared resource in a digital system having a plurality of devices vying for access to the shared resource, comprising the steps of:

initiating an access request by each of the plurality of devices;

providing two priority values along with each access request from each device;

and

arbitrating for access to the shared device by using the higher of the two priority values from each device.

2. The method of Claim 1, wherein the step of providing two priority values comprises the steps of

establishing a software priority state associated with a program module;

executing an instruction from the program module on a first of the plurality of devices to form an access request to the shared resource; and

providing an access priority value with the access request that is responsive to the software priority state of the program module.

3. The method of Claim 2, wherein the step of providing two priority values comprises the step of providing an address space priority value with each request in response to an address specified by each access request.

4. The method of Claim 3, wherein the step of providing an address space priority value comprises the steps of:

assigning address space priority values to pages of memory according to programs or data stored in each page of the memory;

storing at least a portion of the address space priority values in page entries associated with a memory management unit; and

querying the memory management unit with the address specified by the access request.

5. The method according to Claim 4, wherein the step of arbitrating for access comprises the steps of:

selecting a higher priority value from each of the two priority values from each device; and

comparing each of the higher priority values selected from the plurality of devices.

6. The method according to Claim 1, wherein another device vying for access to the shared resource provides one or the other but not both of the two priority values.

7. A digital system comprising:

a shared resource;

a plurality of devices connected to access the shared resource, wherein each device has a request output and circuitry for providing two separate variable priority values;

arbitration circuitry connected to receive a request signal from the request output of each device along with the two priority values from each device, wherein the arbitration circuitry is operable to schedule access to the shared resource according to the higher of the two priority values from each device.

8. A digital system comprising:

a shared resource;

a plurality of devices connected to access the shared resource, wherein each device has an access priority register and a request output, wherein the access

priority register of each device is loaded with a value by software executing on the respective device;

— a plurality of memory management units each connected to receive a virtual address from a respective one of the plurality of devices, wherein each memory management unit stores a plurality of page entries and has an output for an address space priority value contained in each page entry; and

arbitration circuitry connected to receive a request signal from each request output along with an access priority value from each access priority register and an address priority value from each memory management unit, wherein the arbitration circuitry is operable to schedule access to the shared resource according to the access priority value and the address space priority value.

9. The digital system of Claim 8, wherein a portion of the access priority register is set in response to an interrupt received by the respective device.

10. The digital system according to Claim 9, wherein only a portion of the access priority register can be modified by application software being executed on the respective device.

11. The digital system according to Claim 8 being a cellular telephone, further comprising:

an integrated keyboard connected to the CPU via a keyboard adapter;  
a display, connected to the CPU via a display adapter;  
radio frequency (RF) circuitry connected to the CPU; and  
an aerial connected to the RF circuitry.

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